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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/845,405	04/30/2001	Gerhard Beitel	GR 00 P 4091	2869

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EXAMINER

VINH, LAN

ART UNIT

PAPER NUMBER

1765

DATE MAILED: 07/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Appli ation No.

09/845,405

Applicant(s)

BEITEL ET AL.

Examiner

Lan Vinh

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 4-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8-12 is/are allowed.
- 6) ☒ Claim(s) 1 and 4-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/845,405.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

2. Claims 1, 4, 5 are rejected under 35 U.S.C. 102(e) as being anticipated by
Zurcher et al (US 6,344,413)

Zurcher discloses a method for forming a semiconductor device. This method comprises the steps of:

providing a substrate 65 (col 2, lines 49-50)

forming the structured capacitor electrode layers 70 and 80 of a noble metal on the substrate 65, (col 3, lines 18-57), fig. 6 of Zurcher shows that the structured electrode layers having the width of greater than twice the thickness of the layers, which reads on forming the structures on the substrate with an aspect ratio of greater than 2 from a material of noble metal

forming/depositing a sacrificial layer 85 on the structured layers 70 and 80 and substrate 65 (col 4, lines 8-10; fig. 6)

Art Unit: 1765

removing the sacrificial layer 85 and structured layers 70 and 80 in a chemical mechanical polishing step (col 4, lines 11-15; fig. 7)

The limitation of claim 4 has been discussed above

Regarding claim 5, Zurcher discloses that sacrificial layer 85 comprise of silicon oxide (col 4, lines 19-20)

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zurcher et al (US 6,344,413) in view of Ismail et al (US 5,955,759)

Zurcher's method has been described above in paragraph 2. Unlike the instant claimed inventions as per claim 6, Zurcher fails to disclose the step of removing residue of the sacrificial layer by wet processes followed the CMP.

However, Ismail discloses a method for manufacturing a semiconductor device using CMP comprises the step of removing the remaining sacrificial layer 1 by wet etching (col 3, line 48-49)

Hence, one skilled in the art would have found it obvious to modify Zurcher method by adding the step of removing the remaining sacrificial layer 1 by wet etching as per

Art Unit: 1765

Ismail after the CMP step because Ismail teaches that sacrificial layer is preferably removed by wet etching to avoid reactive ion etching damage to the semiconductor structure (col 3, lines 49-50)

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zurcher et al (US 6,344,413) in view of Paranjpe (US 5,434,107)

Zurcher's method has been described above in paragraph 2. Unlike the instant claimed inventions as per claim 7, Zurcher does not disclose the specific aspect ratio during the removing step by polishing.

However, Paranjpe, in a method for planarization by polishing, teaches that the polishing/removing rates are a function of many variables including aspect ratio, material type (col 2, lines 44-46)

Hence, one skilled in the art would have found it obvious to modify Zurcher's polishing method by changing the variable of aspect ratio through conducting routine experimentation to obtain any specific value of aspect ratio in order to achieve a desired polishing rate.

Allowable Subject Matter

6. Claims 8-12 are allowed.

The following is an examiner's statement of reasons for allowance:

Regarding claim 8, the cited prior arts of record fail to disclose the step of performing a polishing step to remove the redepositions of the layer (redeposition that

Art Unit: 1765

emerge at the sidewalls of the mask) being structured so that a structured layer emerges because the applicants have presented a persuasive argument that it would not be obvious to combine the Chien reference and the Huffs reference to produce the claimed invention as per claim 8 because Chien discloses that all the surrounding (conductive interconnection stud) of Chien's redeposition are of fundamental importance to Chien device's operativeness, thus performing a polishing step as taught by Huffs to remove the redepositions in Chien, as proposed in the office action, would have removed the surrounding of Chien's redeposition and rendered Chien's device inoperable.

Response to Arguments

7. The applicants argue that Zurcher does not shows the step of forming the structures on the substrate with an aspect ratio of greater than 2 from a material selected from the group consisting of noble metal. This argument is unpersuasive because as shown in fig. 6 of Zurcher the structured electrode layers of noble metals 70 and 80 having the width of greater than twice the thickness of the layers, which reads on forming the structures on the substrate with an aspect ratio of greater than 2 from a material of noble metal. Therefore, the examiner asserts that Zurcher discloses the step of forming the structures on the substrate with an aspect ratio of greater than 2 from a material selected from the group consisting of noble metal.

The applicants also argue that Zurcher and Paranjpe do not teach firstly to apply a sacrificial layer on these structures and secondly to etch the whole layer including the

Art Unit: 1765

structures. This argument does not commensurate with the scope of claim 1 because claim 1 does not recite the limitation of "secondly to etch the whole layer including the structure"

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

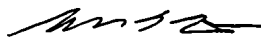
Art Unit: 1765

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Vinh whose telephone number is 703 305-6302. The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Utech can be reached on 703 308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872-9310 for regular communications and 703 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308-0661.


BENJAMIN L. UTECH
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LV
July 25, 2003